

This method of operation was prepared from Issue 10 of Drawing ES-358038

METHOD OF OPERATION

PANEL SYSTEM
LOCAL TEST DESK NO. 12 - B
TELEPHONE CIRCUIT
ARRANGED FOR LOUD SPEAKER TRUNK CIRCUIT

DEVELOPMENT

1. PURPOSE OF CIRCUIT

- 1.1 To provide means for talking and monitoring over trunks, tie lines and test trunks and for talking over loud speaker trunks. Also, to provide means for monitoring on other positions.

2. WORKING LIMITS

- 2.1 Maximum external circuit resistance for B75 relay (TP) is 58 ohms.

3. FUNCTIONS

- 3.01 To trip machine ringing.
- 3.02 To delay closing the talking circuit to the trunk until machine ringing is tripped.
- 3.03 To provide means for dialing over talking trunks and test trunks.
- 3.04 To prevent clicks in the receiver during dialing and ringing.
- 3.05 To provide means for cutting the transmitter and induction coil out of the talking path while listening, for the purpose of reducing noise in the receiver to a minimum.
- 3.06 To provide means for connecting the telephone set to the circuit.
- 3.07 To provide means for monitoring from other positions and desks, except monitoring on loud speaker connections.
- 3.08 To provide means of communicating with other desks and switchboards by call circuits
- 3.09 To provide means for transferring trunks from one position to another as required.
- 3.11 To provide for the use of a chest type transmitter as well as a suspended type when required.

- 3.12 To provide means for communicating over loud speaking telephone circuits at the MDF.
- 3.13 To provide means for holding trunks tie lines, local station lines and switchman's talking lines.
- 3.14 This circuit is arranged to hold the talking connection on a talking trunk when the dial is used with the primary and secondary test circuit.

4. CONNECTING CIRCUITS

- 4.1 Trunk Keys
- 4.2 Primary and Secondary Test Circuit
- 4.3 Outgoing Call Circuit
- 4.4 Monitoring trunk on Chief Switchman's Desk Trunk and Tie Line Circuit
- 4.5 Test Line to M.D.F., I.D.F. and Relay Rk.
- 4.6 Secondary Test Key Circuit for 51 Type Dial Tester
- 4.7 Loud Speaker Trunk Circuit

DESCRIPTION OF OPERATION

5. CIRCUIT OPERATION

5.1 Incoming Calls Not Requiring Common Battery Supervision

When a call is incoming to the desk, the lamp associated with the particular trunk flashes as an incoming signal. The operation of the trunk key at one of the positions to which the trunk is multiplied, connects ground to the "K" lead of the trunk, causing the lamp to change from flashing to steady. The trunk key will close the "T1" & "R1" leads through, to the induction coil and receiver circuit for talking.

5.2 Incoming Calls Requiring Common Battery Supervision

When a call is incoming to the desk, the lamp associated with the particular trunk flashes as an incoming signal. The operation of the trunk key at one of the positions, to which the trunk is multiplied, connects ground to the "K" lead of the trunk, causing the lamp signal to change from flashing to steady; closes the "T" & "R" leads through the (C) retard coil and (TP) relay winding, causing the (T) relay to operate under control of trunk key; the operation of (TP) relay closes the "dial off-normal ground circuit" through to the winding of (T), (TP1) and (TP2) relays, causing the operation of (TP1) relay. The (TP1) relay closes the battery circuit to (TP2) relay, causing the operation of (TP2) relay. The (TP2) relay opens

the battery circuit of (TP1) relay, causing the release of the (TP1) relay. When the (TP2) relay operated it locked to the "dial off-normal ground" through operated contact of (TP) relay. When the (TP1) relay released, with the (TP2) relay locked, the (T) relay battery circuit is closed, causing the operation of (T) relay under control of "off-normal dial contact" and trunk key. The (TP2) relay is slow to operate, and the (TP1) relay is slow to release. These two slow relays will prevent cutting telephone talking circuit across the trunk, until ringing has been tripped. When the (T) relay operates, the (A) resistance, is opened, and the tip and ring is closed through to the induction coil, and the circuit is ready for talking. The function of the (A) resistance when the (T) relay is normal is to trip ringing.

If the test man desires to hold a trunk after having answered it, while he talks over another talking trunk or test trunk, the trunk key is operated to the "hold" position. The operation of the key to the "hold" position, disconnects the trunk circuit from the telephone circuit, in trunk releasing the (TP) relay, which opens the ground circuit for the (TP2) and (T) relays causing their release. The trunk key in the "hold" position, does not remove ground from the "K" lead of the "trunk". The telephone circuit is then free to function with another trunk or with the test circuit.

5.3 Outgoing Calls.

To originate a call at the test desk over a talking trunk or tie line, the "trunk" key is operated. The "trunk" key operated, operates the (TP) relay which closes the "ground" from the off-normal dial contacts to the winding of (T) (TP1) and (TP2) relays and operates the (TP1) relay which in turn operates the (TP2) relay. The (TP2) relay opens the battery of (TP1) relay causing it to release. When the (TP2) relay operated, it locked to the ground through the contacts of (TP) relay and the off-normal dial contacts. When the (TP1) relay released with the (TP2) relay locked, the (T) relay will operate. The (T) relay operated with the "trunk" key operated, the winding of the induction coil is closed through to the "T" and "R" leads of the trunk or tie line. The operation of the "trunk" key connects ground to the "K" lead of the trunk, causing the lamps associated with the trunk at all of the positions to which it is multiplied to be lighted. On calls over ringdown trunks the (RING) key is operated to bring in the signal on ringdown trunks.

5.4 Dialing

When originating calls over talking trunks to line switches or line finders in dial offices, the dial is utilized after the operation of the "trunk" key. When the dial is moved offnormal, the (T) relay will release and the (D) relay will operate. The (T) relay released, opens the receiver circuit and connects (A) resistance 500 ohms in

parallel with winding of (TP) relay in series with (C) retard coil, across the trunk and this circuit is maintained with the dial normal until the (TP), (TP1) and (TP2) relays function. With the dial off-normal the (D) relay being operated, a short circuit is connected around the above parallel circuit and is maintained as long as the dial is off-normal. When the dial returns to normal the short circuit is removed by the release of (D) relay and when the (TP), (TP1) and (TP2) relays function the 500 ohm shunt around (TP) relay and (C) retard coil is removed by the reoperation of (T) relay. This chain of operation is repeated for each number dialed.

5.5 Operation with Primary and Secondary Test Circuit

5.51 Talking

When the talking key is either the primary or secondary test circuit is operated, the "T" and "R" leads are connected to the induction coil and receiver circuit through either (P) or (S) condenser (l.M.F.) for talking.

5.52 Dialing on Subscribers Line Circuit

When "T" wiring is furnished and (T), and (DSL) keys of the primary test circuit are operated, the dial and (TP), (TP1), (TP2), (D) and (T) relays are used and function as follows.

The (TP) relay and (C) retard coil, are bridged across to the "T" and "R" leads of the talking trunk keys by the operation of a relay in the test circuit and the dial is removed from the "T" and "R" leads to the talking trunk keys and connected through the primary test circuit to the subscriber line circuit. The (TP1) relay will operate from ground through the dial contact when the dial is normal, and through operated contacts of a relay of test ckt. The (TP2) relay follows the operation of (TP1) relay, in turn releasing (TP1) relay. When the (TP2) relay operated it locked to the operating ground. With the (TP2) relay operated and locked and the (TP1) relay released the (T) relay will operate, connecting the induction coil and receiver circuit to the subscriber line. The dial may be used as described in the "CD" for the test circuit. When the dial is off normal the (D) relay operates and the (T) and (TP2) relays release. This chain operation is repeated for each digit dialed.

5.6 Operation with Loud Speaker Trunks

To communicate over the loud speaker trunks, the key in the "loud speaker" trunk circuit is operated, connecting ground to the "10" lead to operate the (LS) relay. The (LS) relay operated, (a) transfers the receiver circuit from the induction coil of telephone circuit to the "12" and "13" leads of the trunk circuit, (b) closes an operating path to the trunk for the (LS1) relay, (c) (LS) relay locks to the make contact of the (LS1) relay after the latter has operated. The (LS1) relay operates to ground over "11" lead in the loud speaker trunk circuit and transfers the suspended type transmitter from the primary winding of induction coil of telephone ckt. to the winding of induction coil of "loud speaker" trunk circuit after the operation of (CT) relay of loud speaker trk ckt.

When the key in the loud speaker trk ckt is restored, the (LS1) relay releases disconnecting the transmitter from the induction coil of the "loud speaker trunk ckt" and releasing the (LS) relay. The (LS) relay released, disconnects the receiver from the loud speaker trunk circuit and connects it to the winding of the induction coil of the telephone circuit.

5.7 Incoming and Outgoing Call Circuits

Call circuits from other desks come into the telephone circuit and connect directly to the telephone circuit induction coil. The operator at the other desk can talk to the test man at the position, in all cases except when the test man is talking over the loud speaker trunk or is monitoring or of course when the telephone set is not connected in the circuit. To originate a call to another desk or to a switchboard over a call circuit, the (CC) key of the particular call circuit is operated connecting the telephone circuit of the test desk position to the call circuit as long as the key is held operated.

5.8 Transmitters

Either a suspended or chest type transmitter may be provided.

5.9 Monitoring

When the monitoring key in either the primary or secondary test circuit is operated, the (M) relay operates. The (M) relay operated transfers the receiver from the telephone ckt. induction coil to the 7-8 winding of the 27F repeat coil. The 1-2, 3-4 and 5-6 windings of the 27F repeat coil are connected to the tip and ring of the test cord. This monitoring feature is used on the test trunks and also for monitoring on the telephone circuits of other positions and other desks. When it is desired to monitor on other

positions or other desks, the plug of the primary or secondary test circuit is inserted in the monitoring jack circuit connecting to the desired position or desk. The operation of the test circuit and the telephone circuit for this case is then the same as described above.

5.10 Transfer Key

- If during light load periods, it is desired to transfer the incoming call to the "light load position" the transfer key is operated. This bridges the telephone straps of both positions together and connects them to the light load position telephone circuit.

5.11 Ringing

A ringing key is provided so that the test man may make calls over ringdown trunks and tie lines.

5.12 Transmitter Cut-Out

The operation of the SEC. C.O. key short circuits one winding and opens the other of the 63 induction coil and bridges the telephone receiver directly across the line. Therefore noises picked up by the transmitter will not be induced into the receiver.

6. The Varistor

The resistance of the varistor becomes less as the voltage across its terminals is increased. This characteristic of the varistor when placed in multiple with the receiver reduces the volume of tone to the receiver to a greater extent when the volume is loud than when the volume is normal. In this way the intensity of clicks and loud volume are reduced without appreciably affecting the volume of normal transmission.

ENG. GRK
MD

CHK'D. GRK

APP'D. C.A. MELSHEIMER
CFM

MD

This appendix was prepared from Issue 11 of Drawing ES-359373.

METHOD OF OPERATION

Panel System - Local Test Desk No 12-B - Test Circuit - Supplementary Test Features

Add paragraph 3.10 which reads:-

3.10 Figure 8 is used in testing line relays on coin prepayment lines. It is also arranged to test coin prepayment line relays in panel offices by the use of "E" wiring.

5.4 On second line change "750 ohm retardation coil" to read "750 or 1500 ohm retardation coil". Change last part of paragraph starting with "When the (LRP) key is operated" etc to read "The operation of the (LRP) key opens the 750 or 1500 ohm bridge circuit across the tip and ring and connects ground through retardation coil (CL) to the tip side of the line to test the operation of the line relay on coin prepayment lines. When testing coin prepayment line relays in panel offices "E" wiring is used. Under this condition the 750 and 1500 ohm bridge across the tip and ring is not removed. The operation of key (LRP) connects ground through retard coil (CL) directly to the tip. This ground through the (CL) coil is also connected to the ring through a 750 or 1500 ohm retardation coil in the primary test circuit."

ENG.
G.R.K.
AR

CHK'D.
G.R.K.

APP'D.
C.A.MELSHEIMER
C.F.M.

This appendix was prepared from Issue 10 of Drawing ES-359373

METHOD OF OPERATION

Panel System - Local Test Desk No. 12-B - Test Circuit - Supplementary
Test Features

Add paragraphs 3.8 and 3.9 which read:-

3.8 Figure 10 provides positive station test potential where line insulation breakdown test is not provided.

3.9 Key (BT-1) when operated provides for applying the insulation breakdown test to each side of the line separately.

5.2 Change 10th line to read "lead "H", "A" wiring, and (d) after the operation of the (CR) and"

5.33 Add the following sentence to the paragraph:-

"If trouble is indicated, the (BT-1) key is operated and the test repeated to determine which side of the line has faulty insulation".

5.34 Change last sentence to read, "When the (BT-1) key is operated the tip of the line is tested first and the ring side of the line is tested by operating the reverse key in the test circuit and again turning the insulation breakdown test key (BT) to its operative position".

Add paragraph 5.10 which reads:-

5.10 Figure 10 - Positive Station Test Battery

Where this circuit is to be used to test subscriber lines equipped with tube type subsets a positive station test potential is required. This potential is obtained from the coin control current when regulated between 116 V. and 120 V. or if not available from the line insulation breakdown test battery when provided. If neither of the above is available this potential is obtained from Figure 10.

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